The jets are arranged to impinge in pairs, and the water is thereby sub-divided into fine spray and is projected across the open intervening-space in the wheel to which the air from the condenser has access. In fig. 22 the exhaust steam meets with these water jets and is condensed. In any case the air is entrained by the jets of water and is carried into the circumferential blades of the rotating impeller. The velocity of the water acquired in these blades is sufficient to cause discharge through the surrounding guide blades against the external pressure.

Fig. 24.—Willans-Mulier Ejector

The ejector condenser discussed on p. 219 discharges the air associated with the steam by the entraining action of the condensing water flowing at a moderate velocity through the central cone. Such an arrangement, however, is only serviceable when working as a jet condenser. Hydraulic vacuum pumps have been introduced in recent years to act solely as air-pumps. One example of this type is illustrated in fig. 23, which represents the action of the Wor-thington hydraulic vacuum pump. A centrifugal operating pump takes its

water from a tank, and discharges the water under a suitable pressure through a regulating valve into the annular nozzle of the ejector. After leaving the nozzle the water passes through a jet-transforming wheel, by which the annular jet of water is divided up into a number of jets of approximately rectangular cross-section, leaving sufficient space between each other for the entry of air and vapour from the condenser. At the same time the wheel imparts to the jets a rapidly revolving motion, as the result of which the water jets rush through the ejector cone and diffuser in the form of a helix, with the pitch and velocity diminishing as the compression of the air and vapour goes on. The jet-transforming wheel is carefully balanced and has highly-polished surfaces inside, being supported on a spindle rotating in well-lubricated ball-bearings, so that it offers practically no resistance to the flow of the water.

The water discharged by the ejector into the tank gives up the air entrained, and is circulated over again by the centrifugal pump.

In order to prevent an undesirable rise of temperature a small quantity of cold water is constantly supplied to the tank, which is also provided with an overflow.

The Willans-Muller ejector air-pump operates in a similar manner, except that a separate centrifugal pump is usually dispensed with under